Agrium Material Safety Data Sheet

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	PROTECTIVE CLOTHING
Health 1, Flammability 0, Reactivity 0, Specific Hazard			

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME **Ammonium Sulfate, Granular 20-0-0-24S**

SYNONYM	20-0-0-24 Ammonium Sulfate	**MSDS NUMBER:**	**14079**
CHEMICAL NAME	Ammonium sulfate	**REVISION NUMBER**	4.7
CHEMICAL FAMILY	Ammonium salt.	**MSDS prepared by the Environment, Health and Safety Department on:**	**February 18, 2004**
CHEMICAL FORMULA	$(NH_4)_2SO_4$	**24 HR EMERGENCY TELEPHONE NUMBER:**	
MATERIAL USES	Agricultural industry: Fertilizer. Industrial applications: Manufacture of specialty fertilizers.	**Transportation: 1-800-792-8311** **Medical: 1-888-670-8123**	

MANUFACTURER

Teck Cominco Metals Ltd
Trail, B.C., Canada
V1R 4L8

SUPPLIER

Agrium
North American Wholesale
13131 Lake Fraser Drive, S.E.
Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.
Suite 1700, 4582 South Ulster St.
Denver, Colorado, U.S.A., 80237

Section II. Hazardous Ingredients

		Exposure Limits (ACGIH)						
NAME	**CAS #**	**TLV-TWA mg/m³**	**TLV-TWA ppm**	**STEL mg/m³**	**STEL ppm**	**CEIL mg/m³**	**CEIL ppm**	**% by Weight**
Ammonium sulfate	7783-20-2	10						100

TOXICOLOGICAL DATA ON INGREDIENTS

Ammonium Sulfate TFI Product Testing Program Results:
Acute oral LD_{50}, rat: >2,000-4,250 mg/kg
Acute oral LD_{50}, mouse: 640 mg/kg
Acute dermal LD_{50}: >2,000 mg/kg (rat, mouse)

Ecotoxicity:
Acute toxicity to fish, Coho salmon, rainbow trout, largemouth bass, bluegill, fathead minnow, 24-96 hr LC_{50}: >90->1500 mg/L
Acute toxicity to aquatic invertibrates, Daphnia magna, 50-96 hr LC_{50}: >433 mg/L
Amphipod, 96 hrs, LC_{50}=40-62 mg/L
Snails, 48-96 hrs, LC_{50}=>100-700 mg/L
Toxicity to aquatic plants, Chlorella vulgaris, 21 days, NOEC=250 mg N/L
Chronic toxicity to fish, Rainbow trout, 12 & 35 days, LC_{50}: 0.26-0.68 mg unionized NH_3/L
Pink salmon, 21, 40, & 61 days, NOEC=1.2mg unionized NH_3/L
Channel catfish, 6 months, LOEC=100-500 mg/L

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Section III. Hazards Identification.

POTENTIAL ACUTE HEALTH EFFECTS	This product may irritate eyes and skin upon prolonged or repeated contact. Over-exposure by inhalation may cause respiratory tract irritation. Ingestion of this substance may produce irritation of the gastro-intestinal tract, characterized by burning and diarrhea.
POTENTIAL CHRONIC HEALTH EFFECTS	**CARCINOGENIC EFFECTS**: NONE by ACGIH, EPA, IARC, NTP, OSHA. **MUTAGENIC EFFECTS**: NONE by ACGIH, EPA, IARC, NTP, OSHA. **TERATOGENIC EFFECTS**: NONE by ACGIH, EPA, IARC, NTP, OSHA. There is no known effect from chronic exposure to this product.

Section IV. First Aid Measures

EYE CONTACT	Causes eye irritation. Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention if irritation persists.
MINOR SKIN CONTACT	May cause skin irritation. Wash contaminated skin with soap and water. Cover dry or irritated skin with a good quality skin lotion. If irritation persists, seek medical attention.
EXTENSIVE SKIN CONTACT	No additional information.
MINOR INHALATION	Repeated or prolonged inhalation of dust may lead to respiratory irritation. Loosen tight clothing around the neck and waist. Allow the person to rest in a well ventilated area. Obtain medical attention if irritation persists.
SEVERE INHALATION	In emergency situations use proper respiratory protection to evacuate affected individuals to a safe area as soon as possible. Loosen tight clothing around the person's neck and waist. Oxygen may be administered if breathing is difficult. If the person is not breathing, perform artificial respiration. Obtain immediate medical attention.
SLIGHT INGESTION	If conscious, have person drink several glasses of water or milk and induce vomiting. NEVER induce vomiting or give anything by mouth to an unconscious person. Obtain medical attention.
EXTENSIVE INGESTION	No additional information.

Section V. Fire and Explosion Data

THE PRODUCT IS	Non-flammable.
AUTO-IGNITION TEMPERATURE	Not applicable.
FLASH POINT	Not applicable.
FLAMMABILITY LIMITS	Not applicable.
PRODUCTS OF COMBUSTION	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases: ammonia, nitrogen oxides (NO, NO_2...), sulfur oxides (SO_2, SO_3 ...)
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Not applicable.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	This product is non-explosive. Sensitizer. Increases explosion hazard of ammonium nitrate when mixed together.
FIRE FIGHTING MEDIA AND INSTRUCTIONS	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases. Use extinguishing media suitable for surrounding materials.
SPECIAL REMARKS ON FIRE HAZARDS	Non combustible. Flammable/toxic gases will form at elevated temperatures (>280°C) by thermal decomposition (ammonia, sulfur oxides, nitrogen oxides). A self contained breathing apparatus should be used to avoid inhalation of toxic fumes.

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SPECIAL REMARKS ON EXPLOSION HAZARDS	No additional remark.

Section VI. Accidental Release Measures

SMALL SPILL	Use appropriate tools to put the spilled solid in a suitable container for intended use or disposal.
LARGE SPILL	Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses, wells, etc. Product will promote algae growth which may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250 mg/L (U.S.) or 500 mg/L (Canada). Will dissolve and disperse in water. Reclaiming material may not be viable. Recover and place material in suitable containers for recycle, reuse, or disposal. Ensure disposal complies with government requirements and local regulations.

Section VII. Handling and Storage

PRECAUTIONS	Avoid contact with skin and eyes. After handling, always wash hands thoroughly with soap and water. Do not breathe dust. Keep away from food, drink and animal feed. Avoid contact with incompatible substances. Keep out of reach of children.
STORAGE	Store in a dry, cool and well ventilated area.

Section VIII. Exposure Controls/Personal Protection

ENGINEERING CONTROLS	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit.
PERSONAL PROTECTION	The selection of personal protective equipment varies, depending upon conditions of use. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields.
PERSONAL PROTECTION IN CASE OF LARGE RELEASE	No additional information.
EXPOSURE LIMITS	OSHA PEL: 15 mg/m3 for Particulates Not Otherwise Regulated (nuisance particulates). Federal, State or Provincial exposure limits may vary by jurisdiction. Consult local authorities for acceptable exposure limits in your area.

Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Solid white crystalline granules.		
MOLECULAR WEIGHT	132.14	**COLOR**	White.
pH (10% SOLN/WATER)	5	**ODOR**	Odorless.
BOILING POINT	Decomposes.	**ODOR THRESHOLD**	17 PPM (Ammonia)
MELTING POINT	235°C (455°F)	**TASTE**	Acrid.
CRITICAL TEMPERATURE	Not available.	**VOLATILITY**	Not applicable.
SPECIFIC GRAVITY g/cc	0.913 (Water = 1)	**SOLUBILITY**	Easily soluble in hot water. Soluble in cold water.
BULK DENSITY kg/m^3 ; lbs/ft^3	Loose: 865 kg/m^3; 54 lbs/ft^3; Packed: 910 kg/m^3;	**DISPERSION PROPERTIES**	See solubility in water.
VAPOR PRESSURE	Not applicable.	**WATER/OIL DIST. COEFF.**	Not available.
VAPOR DENSITY	Not applicable.		

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Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional remark.
INCOMPATABILITY WITH VARIOUS SUBSTANCES	Slightly reactive to reactive with oxidizing agents. Very slightly to slightly reactive with metals, alkalis, moisture. Non-reactive with reducing agents, combustible materials, organic materials, acids.
CORROSIVITY	A mineral salt. Highly corrosive to aluminum, zinc, and copper. Slightly corrosive to mild steel and 304 stainless steel. Non-corrosive to 316 stainless steel.
SPECIAL REMARKS ON REACTIVITY	Avoid contact with moisture. Hydrolysis will slowly produce acids corrosive to metals.
SPECIAL REMARKS ON CORROSIVITY	Incompatible with copper alloys. Corrosive to brass. Corrosive to ferrous metals and alloys. Contact your sales representative or a metallurgical specialist to ensure compatability with system equipment.

Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	See Section II.
SPECIAL REMARKS ON TOXICITY TO ANIMALS	The product itself and its products of degradation are not toxic under normal conditions of use. Will release ammonium ions. Ammonia is a toxic hazard to fish. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs.
OTHER EFFECTS ON HUMANS	Our data base contains no additional remark on the toxicity of this product
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No additional remark.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	No additional remark.

Section XII. Ecological Information

ECOTOXICITY	Non-persistent. Non-cumulative when applied using normal agricultural practices. The product itself and its products of degradation are not harmful under normal conditions of careful and responsible use. Aquatic/Marine Toxicity: Will disperse with current. Release to watercourses may cause effects down stream from the point of release. Will release ammonium ions. Ammonia is a toxic hazard to fish. Avoid spills or release to watercourses. U.S. D.O.T.: This material NOT listed as a Marine pollutant.
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Nitrogen oxides (NO,NO_2 ...). Sulfur oxides (SO_2, SO_3 ...).
TOXICITY OF THE PRODUCTS OF DEGRADATION	The product itself and its products of degradation are not harmful under normal conditions of use. Avoid spills or releases to watercourses.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	Product will promote algae growth which may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250 mg/L. Will dissolve and disperse in water. Reclaiming material may not be viable.

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Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING	Recover and place material in a suitable container for intended use or disposal. Recycle to process, if possible. Ensure disposal complies with government requirements and local regulations.

Section XIV. Transport Information

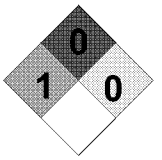
DOT / TDG CLASSIFICATION	Not controlled under TDG (Canada) or D.O.T. (U.S.A.)
PIN and Shipping Name	Not applicable.
SPECIAL PROVISIONS FOR TRANSPORT	Exempt Material
DOT (U.S.A) (Pictograms)	

Section XV. Other Regulatory Information and Pictograms

OTHER REGULATIONS	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA. TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory. CERCLA/SUPERFUND, 40 CFR 117,302: This product contains no Reportable Quantity (RQ) Substances. This product is not considered as a priority pollutant as regulated under the Clean Water Act. This product contains the following chemical subject to the reporting requirements of SARA Section 313 and 40 CFR 372: Aqueous ammonia from water dissociable ammonium ions; 10% of total aqueous ammonia is reportable under this listing), CAS# 7783-20-2: 25.78 wt% , see EPA doc 745-R-95-012)	
OTHER CLASSIFICATIONS	**HCS (U.S.A.)**	Not controlled under the HCS (United States).
	DSCL (EEC)	Not controlled under DSCL (Europe).

National Fire Protection Association (U.S.A.)

Hazards presented under acute emergency conditions only:



Health

Fire Hazard

Reactivity

Specific Hazard

TDG (Pictograms - Canada)	
DSCL (Europe) (Pictograms)	
ADR (Europe) (Pictograms)	

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Section XVI. Other Information

REFERENCES

-Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
-Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
-Domestic Substances List, Canadian Environmental Protection Act.
-29 CFR Part 1910
-33 CFR Parts 151, 153, 154, 156
-40 CFR Parts 1-799
-46 CFR Part 153
-49 CFR Parts 1-199
-American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2003.
-NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
-Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
-TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: http://csi.micromedex.com (2003). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2003); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2003); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2003); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2003); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2003); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2003); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2003); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2003).
-The Fertilizer Institute Product Testing Program Results, March 2003

OTHER SPECIAL CONSIDERATIONS

Not applicable.

FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT

AGRIUM
Environment, Health and Safety Department
Telephone (403) 225-7380 or Fax (403) 225-7608

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